

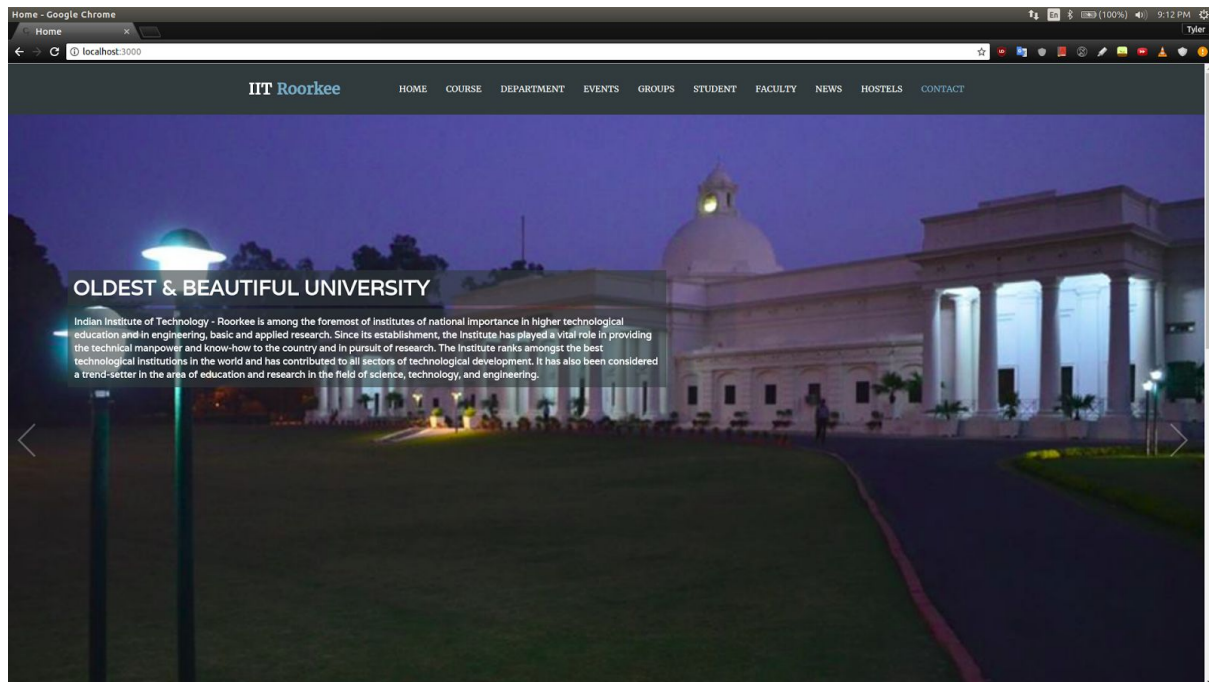
Database Management System

# Course Project - Final Report

Project No: 2D

MockCollege Database

GithubLink: <https://github.com/msharsha555/Classroom>



HarshaVardhan Mlryala(15114045)

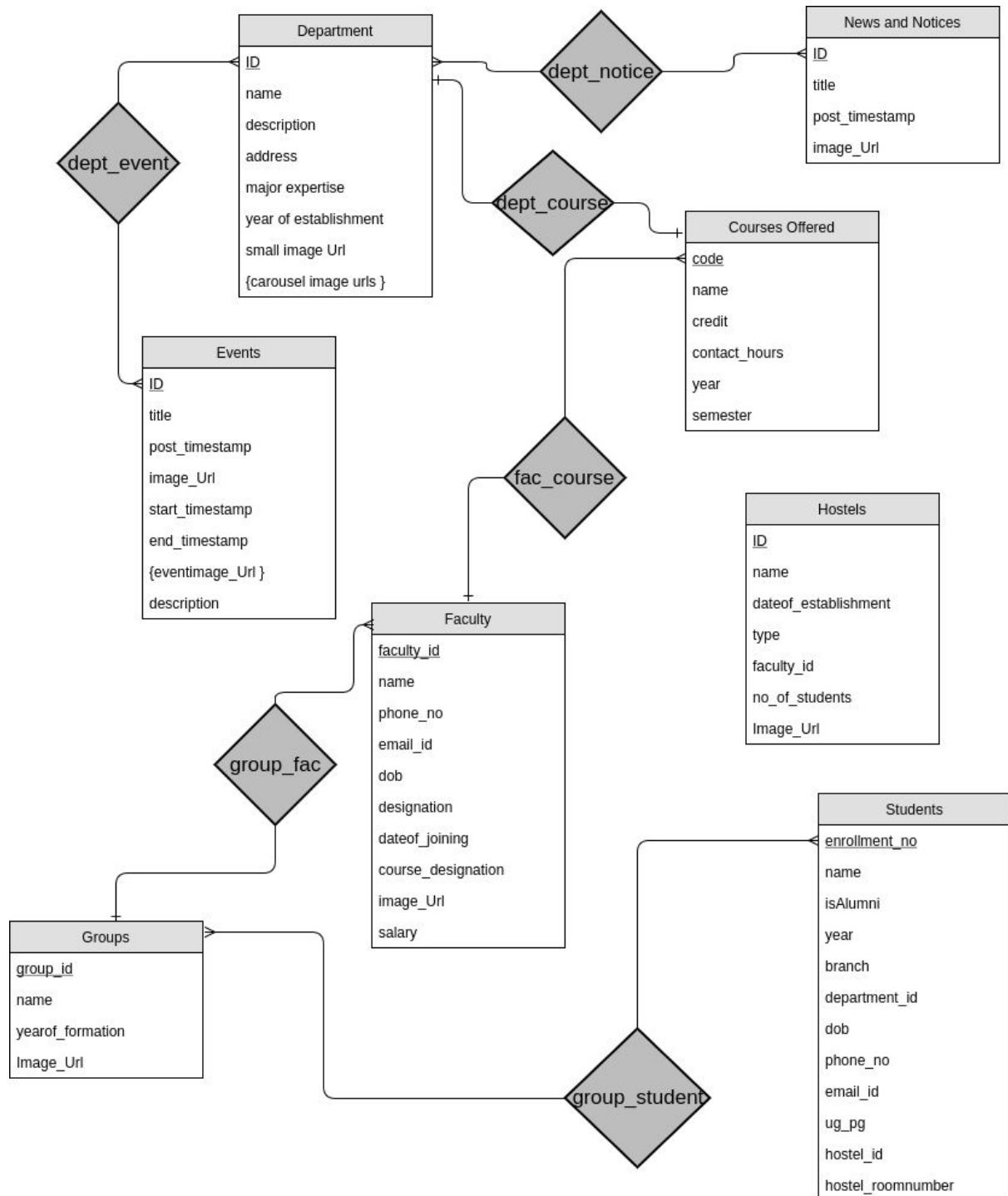
Sri Harsha Majeti (15114044)

Sanju Prabhath Reddy (15114042)

Utsav Mangal (15114075)

Siraz Sheikh (15114065)

## ER Diagram :



## Initial Schemas :

### Department: (

ID, name, description, address, major expertise, year of establishment, small image  
Url, {carousel image urls}  
)

### News and Notices : (

ID, title, post timestamp, image Url, description  
)

### Dept\_notice: (

d\_id, n\_id  
)

### Events: (

ID, title, post timestamp, central\_image Url, event start timestamp, event end  
timestamp, description, {event\_image Url}  
)

### Dept\_event: (

d\_id, e\_id  
)

### Courses: (

D\_id, code, faculty\_id, name, credit, contact hours, year, semester  
)

### Faculty: (

Group\_id, faculty id, name, phone no., email id, dob, designation, date of Joining,  
course\_specialization, image URI, salary  
)

### Groups: (

group id, name, year of formation  
)

**Students: (**

enrollment no., name, isAlumni, year, branch, department Id, dob, phone no. Email Id, ug\_pg, hostel Id, hostel room number  
)

**Hostel : (**

Id, name, date of establishment, type, faculty Id, Number of students, Image Url  
)

**NOTE :**

In Group entity, {student\_id} is not needed if u want to represent a relationship there. Similarly for the group\_id in Students. Also there is no need of representing a many to one relationship between Students and Hostel as hostel\_id is already present in the entity.

The above are the obtained schemas with the corresponding primary keys.

The FDs that can be inferred from the schemas are :

Department:

- Id -> name, description, address, major expertise, year of establishment, small image Url, {carousel image urls}

There is no FD where the left hand side is not a primary key. ID is the primary key.

News and Notices :

- Id -> title, post timestamp, image Url, description

There is no FD where the left hand side is not a primary key. ID is the primary key.

Dept\_event :

There is no FD where the left hand side is not a primary key. (e\_id, d\_id) is the primary key. All attributes form the candidate key.

Dept\_notice:

There is no FD where the left hand side is not a primary key. (d\_id, n\_id) is the primary key. All attributes form the candidate key.

Events :

- Id -> title, post timestamp, image Url, event start timestamp, event end timestamp and description

There is no FD where the left hand side is not a primary key.ID is the primary key.

Courses:

- { D\_id, code, faculty\_id } -> name, credit, contact hours, year, semester

There is no FD where the left hand side is not a primary key.code is the primary key.

Faculty :

- { Group\_id, faculty\_id } -> name, phone no., email id, dob, designation, date of Joining, course specialization, image URL, salary

There is no FD where the left hand side is not a primary key.faculty\_id is primary key.

Groups :

- group\_id -> name, year of formation

There is no FD where the left hand side is not a primary key.group\_id is the primary key.

Students:

- enrollment no. -> name, isAlumni, year, branch, department Id, dob, phone no. Email Id, ug\_pg, hostel Id, hostel room number

There is no FD where the left hand side is not a primary key.enrollment\_no is the primary key.

So from the above FDs we can say that only 1NF normalisation would suffice and after that all the schemas are in 5NF.

1 NF needs to be done in Department and Events.

So, the new schemas formed are

**Dept\_images :** (  
d\_ID, carousel\_image Url  
)

```
Event_images : (  
e_ID,event_image Url  
)
```

The present FDs is the minimal closure and we don't need to do any further processing.

Hence , the final schemas along with the attribute initialisations are -

### **Department**

```
{  
    ID varchar(20)  
    Name varchar(50)  
    Description varchar(2000)  
    Address varchar(100)  
    major expertise varchar(50)  
    year of establishment int(4)  
    small image Url varchar(100)  
    Primary key ID  
}
```

### **News**

```
{  
    ID varchar(20)  
    Title varchar(20)  
    Post timestamp TIMESTAMP  
    Description varchar(2000)  
    image Url varchar(100)  
    Primary key ID  
}
```

### **Dept\_notice**

```
{  
    d_ID varchar(20)  
    n_ID varchar(20)  
    Primary key (d_ID,n_ID)  
    Foreign key d_ID references Department  
    Foreign key n_ID references News  
}
```

### **Events**

```
{  
    ID varchar(20)  
    Title varchar(20)
```

```

    post timestamp TIMESTAMP
    central_image Url varchar(100)
    event start timestamp TIMESTAMP
    event end timestamp TIMESTAMP
    Description varchar(2000)
    Primary key ID
}
Dept_event
{
    e_ID varchar(20)
    d_ID varchar(20)
    Primary key (e_ID,d_ID)
    Foreign key e_ID references Events
    Foreign key d_ID references Department
}
Courses
{
    d_ID varchar(20)
    Code varchar(20)
    Faculty_id varchar(20)
    Name varchar(50)
    Credit int(10)
    contact hours number(6,2)
    Year int(10)
    Semester int(10)
    Primary key (d_ID,Code,Faculty_id)
    Foreign key d_ID references Department
    Foreign key faculty_id references Faculty
}

```

## **Faculty**

```

{
    -- Group_id varchar(20)
    faculty_id varchar(20)
    Name varchar(50)
    phone no. varchar(20)
    email id varchar(100)
    Dob TIMESTAMP
    Designation varchar(2000)
    date of Joining TIMESTAMP
    Course_specialization varchar(20)
    image URI varchar(100)
}

```

```
    salary int(20)
    Primary key (faculty_id,Group_id)
    Foreign key Group_id references Group
}
```

### **Groups**

```
{
    Group_id varchar(20)
    Name varchar(50)
    ++ Description
    year of formation int(20)
    Primary key group_id
    ++ Faculty_Id
}
```

### **Student**

```
{
    enrollment no. varchar(20)
    name varchar(50)
    isAlumni boolean
    Year numeric(4,0)
    Branch varchar(20)
    department Id varchar(20)
    Dob TIMESTAMP
    phone no varchar(20)
    Email Id varchar(100)
    Ug_pg varchar(20)
    hostel Id varchar(20)
    hostel room number int(20)
    Primary key enrollment_no
    Foreign key (department_id,hostel_id) references (department,hostel)
}
```

### **Dept\_images**

```
{
    d_ID varchar(20)
    carousel_image Url varchar(100)
    Primary key (d_ID,carousel_image)
    Foreign key d_ID references Department
}
```

### **Event\_images**

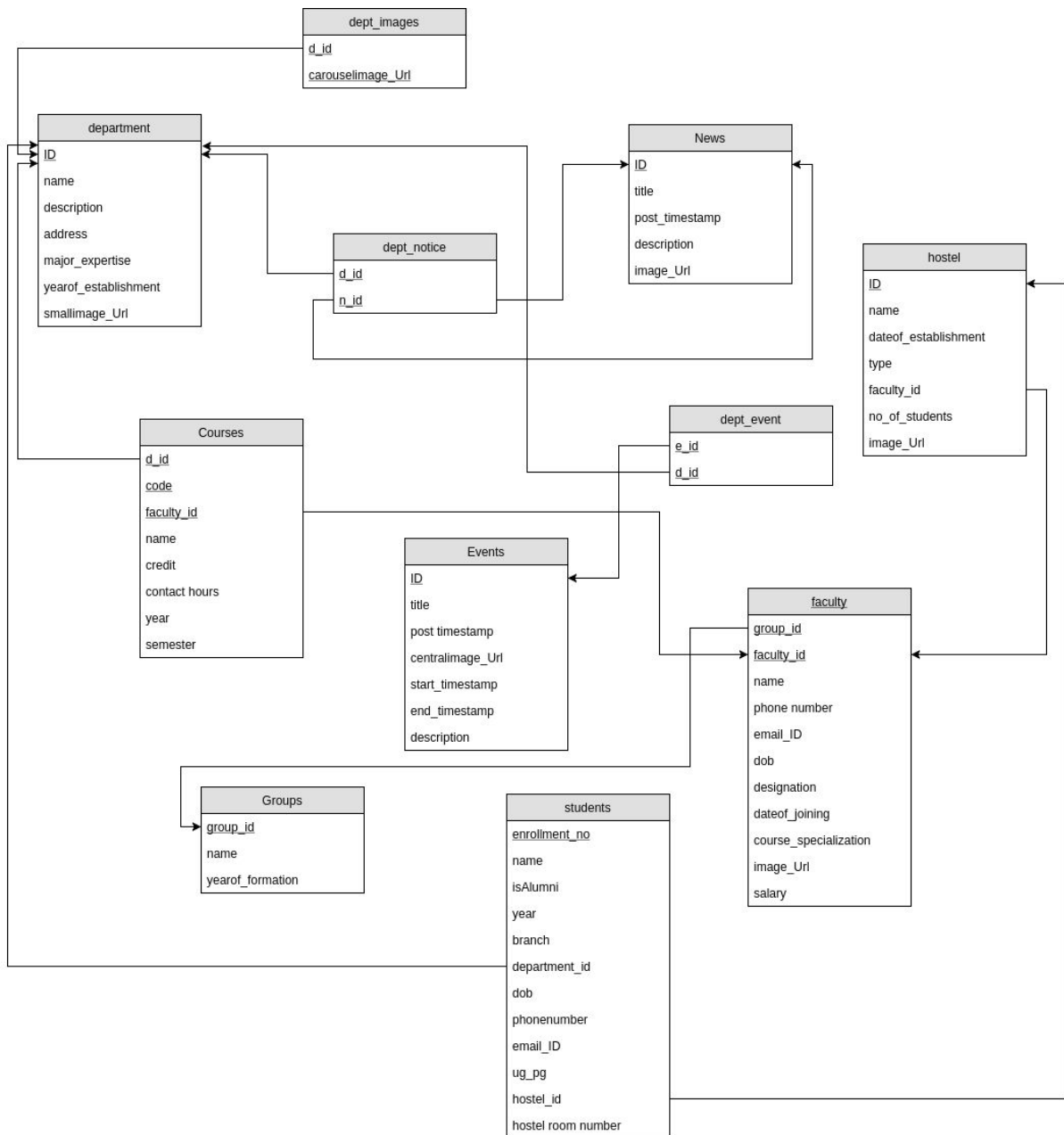


```
{  
    e_ID varchar(20)  
    event_image Url varchar(100)  
    Primary key (e_ID,event_image)  
    Foreign key e_ID references Event  
}
```

## **Hostel**

```
{  
    ID varchar(20)  
    Name varchar(50)  
    date of establishment TIMESTAMP  
    Type varchar(10)  
    faculty Id varchar(20)  
    Number of students int(20)  
    Image Url varchar(100)  
    Primary key ID  
    Foreign key faculty id references Faculty  
}
```

### Final Schema Diagram :



## 2NF, 3NF, BCNF 4NF, 5NF?

Observation: In all our tables, we have FDs of type  $X \rightarrow A$ ,  $X \in \text{Candidate Key}$ .

### 2NF:

Since  $X \in \text{Candidate Key}$ , no non-prime attribute can be dependent on a subset of candidate key.

### 3NF:

Since  $X \in \text{Candidate Key}$ , there cannot be a functional dependency from non-prime attribute to non-prime attribute

### BCNF:

Since  $X \in \text{Candidate Key} \in \text{Super Key}$ , this means all our tables are in BCNF.

Since there are no multi-valued dependencies or Join Dependencies, the schema is in **5NF**

## Introduction:

Our home page contains links to

1. Courses offered in the college
2. Departments available in the college
3. Current Events happening in the college
4. Internal College Groups
5. Student List with Data
6. Faculty Information
7. News happening on Campus

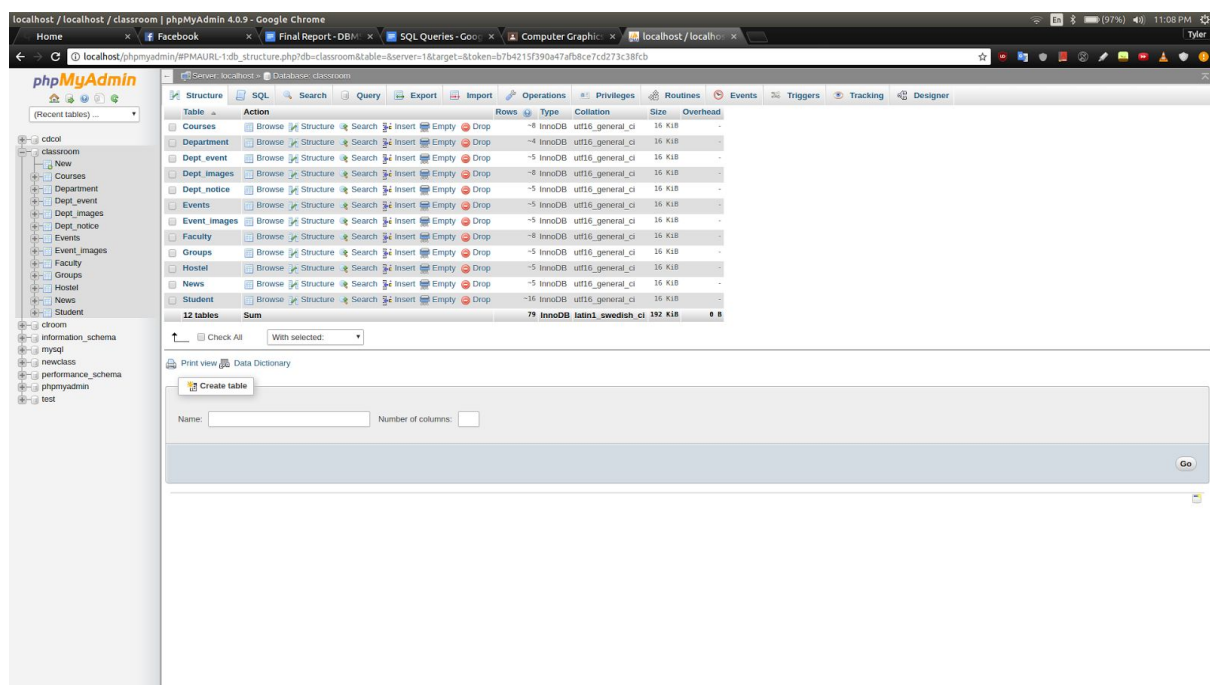
8. Hostels available
9. Contact information

There are separate pages for each of the departments of the college. Similarly there are separate pages for Events.

## Final Database

Some changes are made compared to our previous schema (as in part 1),

- From the Faculty relation, removed **Group\_Id**
- Added attributes **Description** and **Faculty\_Id** to the Groups relation.



## News

### Current news in the campus

The screenshot displays the IIT Roorkee website in a Google Chrome browser. The page features a dark navigation bar with the IIT Roorkee logo and links to Home, Course, Department, Events, Groups, Student, Faculty, News, Hostels, and Contact. The main content area is divided into two columns. The left column, titled 'ABOUT US', contains three paragraphs of text describing the institute's history, its role in technological development, and its academic offerings. The right column, titled 'NEWS', lists five recent news items, each with a thumbnail image, a title, and a date. The items are: 'Yodlee:Submission' (Fri Nov 03 2017), 'Arihant Textiles' (Wed Nov 01 2017), 'MCM Scholarship' (Tue Oct 31 2017), 'Smart-World-Solar' (Tue Oct 31 2017), and 'Citi Campus Innovate' (Tue Oct 31 2017). A 'See All' link is located at the bottom right of the news list. The footer contains a 'COMMUNITY' section with links to 'Our Tutors', 'Our Students', and 'Our Structure', and a 'SOCIAL LINKS' section with icons for Facebook, Twitter, Google+, LinkedIn, and YouTube, along with an upward arrow icon.

Home - Google Chrome  
localhost:3000

IIT Roorkee HOME COURSE DEPARTMENT EVENTS GROUPS STUDENT FACULTY NEWS HOSTELS CONTACT

### ABOUT US

Indian Institute of Technology - Roorkee is among the foremost of Institutes of national importance in higher technological education and in engineering, basic and applied research. Since its establishment, the Institute has played a vital role in providing the technical manpower and know-how to the country and in pursuit of research. The Institute ranks amongst the best technological institutions in the world and has contributed to all sectors of technological development. It has also been considered a trend-setter in the area of education and research in the field of science, technology, and engineering.

The Institute had celebrated its Sesquicentennial in October 1996 and now completed more than 170 years of its existence. It was converted to IIT on September 21, 2001 by an Ordinance issued by the Government of India declared it as the nation's seventh Indian Institute of Technology, an "Institution of National Importance".

The Institute offers Bachelor's Degree courses in 10 disciplines of Engineering and Architecture and Postgraduate's Degree in 55 disciplines of Engineering, Applied Science, Architecture and planning. The Institute has facility for doctoral work in all Departments and Research Centres.

The Institute admits students to B.Tech. and B.Arch. courses through the Joint Entrance Examination (JEE) conducted at various centres all over India.

### NEWS

#### EVENTS

- Yodlee:Submission**  
Fri Nov 03 2017 00:00:00 GMT+0530 (IST)
- Arihant Textiles**  
Wed Nov 01 2017 00:00:00 GMT+0530 (IST)
- MCM Scholarship**  
Tue Oct 31 2017 00:00:00 GMT+0530 (IST)
- Smart-World-Solar**  
Tue Oct 31 2017 00:00:00 GMT+0530 (IST)
- Citi Campus Innovate**  
Tue Oct 31 2017 00:00:00 GMT+0530 (IST)

[See All](#)

COMMUNITY  
Our Tutors  
Our Students  
Our Structure

SOCIAL LINKS  
f t g+ in y

## Events

### Current events happening in the campus

The screenshot displays the IIT Roorkee website in a Google Chrome browser, showing the 'EVENTS' section. The layout is similar to the previous screenshot, but the 'NEWS' section is now titled 'EVENTS' and lists five upcoming events. The events are: 'Technology Workshop' (Wed Nov 08 2017), 'Screening of movie N' (Sun Nov 05 2017), 'general quiz' (Sat Nov 04 2017), 'mental health quiz' (Fri Nov 03 2017), and 'Rally for Rivers rea' (Thu Nov 02 2017). A 'See All' link is located at the bottom right of the events list. The footer remains the same, with 'COMMUNITY' and 'SOCIAL LINKS' sections.

Home - Google Chrome  
localhost:3000

IIT Roorkee HOME COURSE DEPARTMENT EVENTS GROUPS STUDENT FACULTY NEWS HOSTELS CONTACT

### ABOUT US

Indian Institute of Technology - Roorkee is among the foremost of Institutes of national importance in higher technological education and in engineering, basic and applied research. Since its establishment, the Institute has played a vital role in providing the technical manpower and know-how to the country and in pursuit of research. The Institute ranks amongst the best technological institutions in the world and has contributed to all sectors of technological development. It has also been considered a trend-setter in the area of education and research in the field of science, technology, and engineering.

The Institute had celebrated its Sesquicentennial in October 1996 and now completed more than 170 years of its existence. It was converted to IIT on September 21, 2001 by an Ordinance issued by the Government of India declared it as the nation's seventh Indian Institute of Technology, an "Institution of National Importance".

The Institute offers Bachelor's Degree courses in 10 disciplines of Engineering and Architecture and Postgraduate's Degree in 55 disciplines of Engineering, Applied Science, Architecture and planning. The Institute has facility for doctoral work in all Departments and Research Centres.

The Institute admits students to B.Tech. and B.Arch. courses through the Joint Entrance Examination (JEE) conducted at various centres all over India.

### EVENTS

#### NEWS

- Technology Workshop**  
Wed Nov 08 2017 00:00:00 GMT+0530 (IST)
- Screening of movie N**  
Sun Nov 05 2017 12:00:00 GMT+0530 (IST)
- general quiz**  
Sat Nov 04 2017 10:00:00 GMT+0530 (IST)
- mental health quiz**  
Fri Nov 03 2017 03:00:00 GMT+0530 (IST)
- Rally for Rivers rea**  
Thu Nov 02 2017 00:20:00 GMT+0530 (IST)

[See All](#)

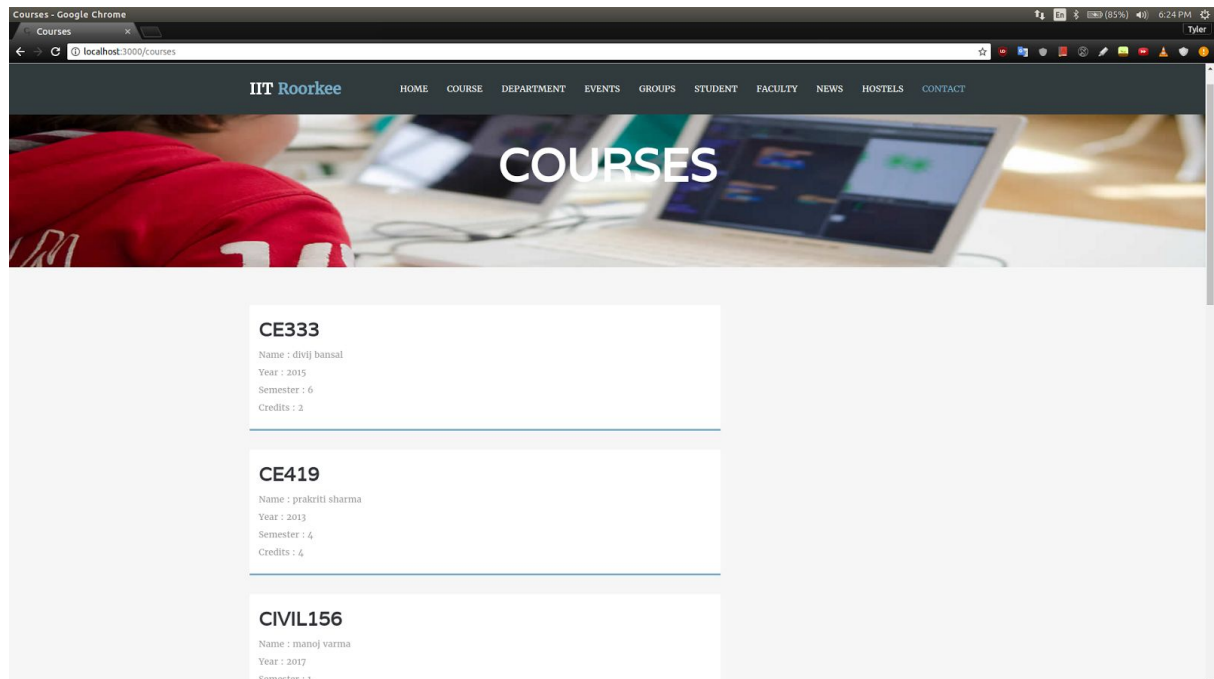
COMMUNITY  
Our Tutors  
Our Students

SOCIAL LINKS  
f t g+ in y

localhost:3000/events

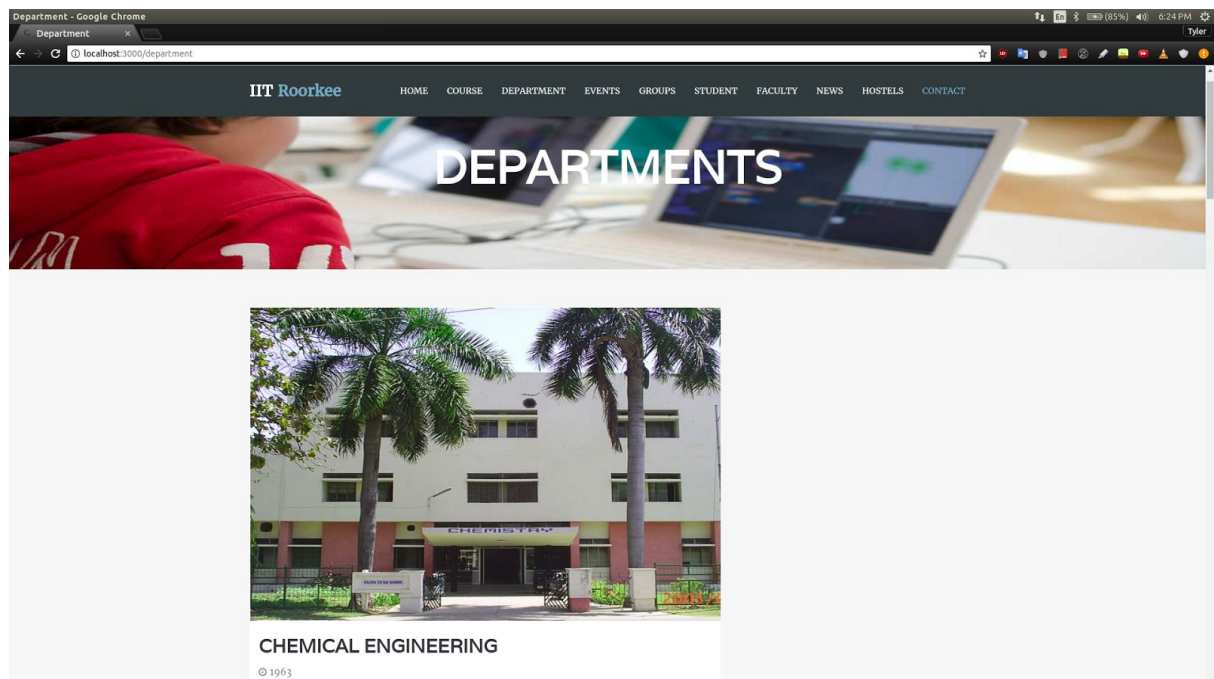
## Courses

Courses offered in the college



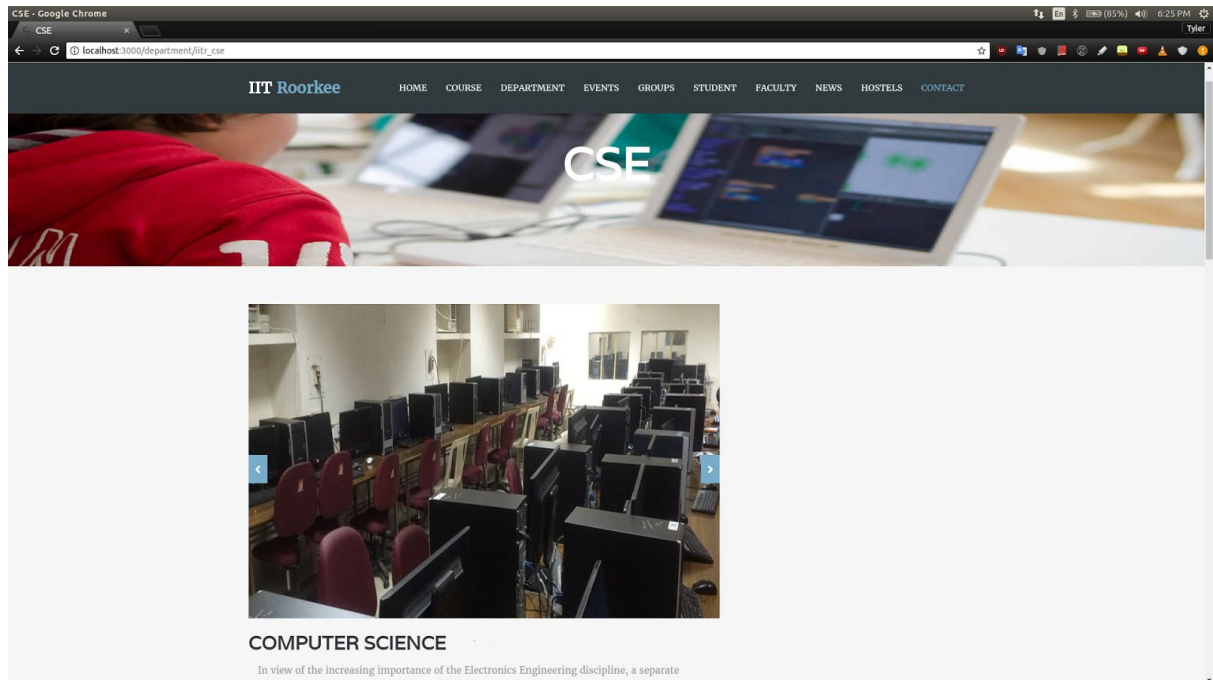
## Departments as a whole

All the departments in the campus



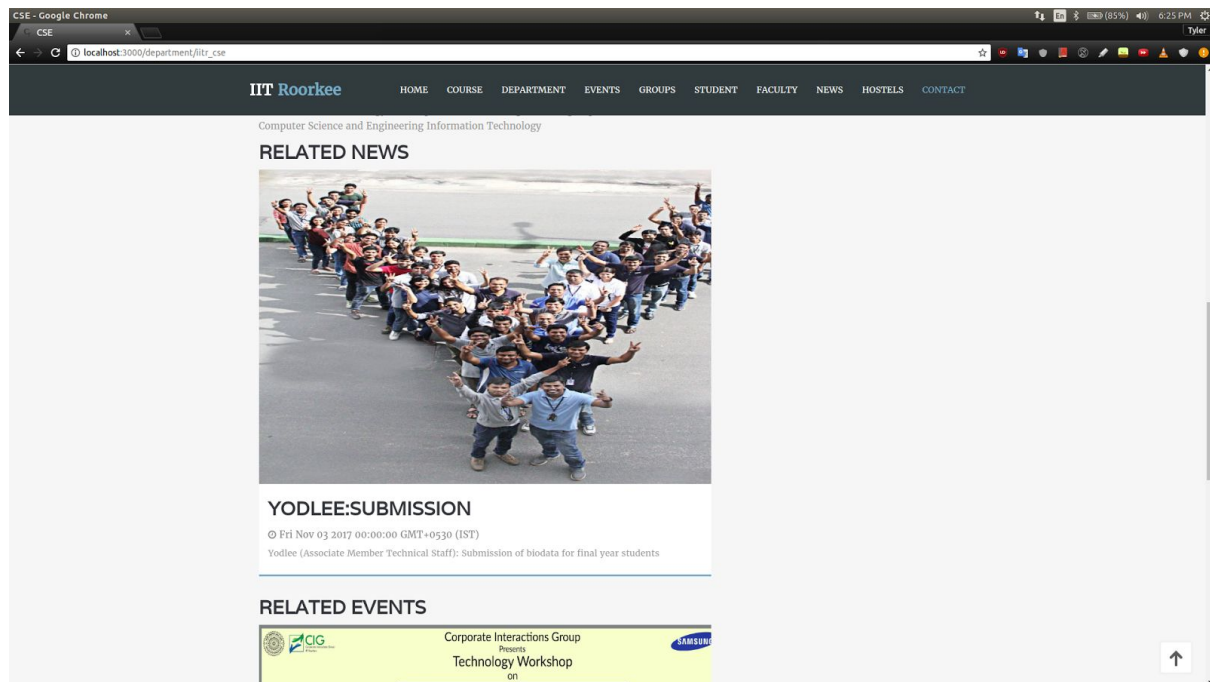
## Departments Individually

More information about the departments



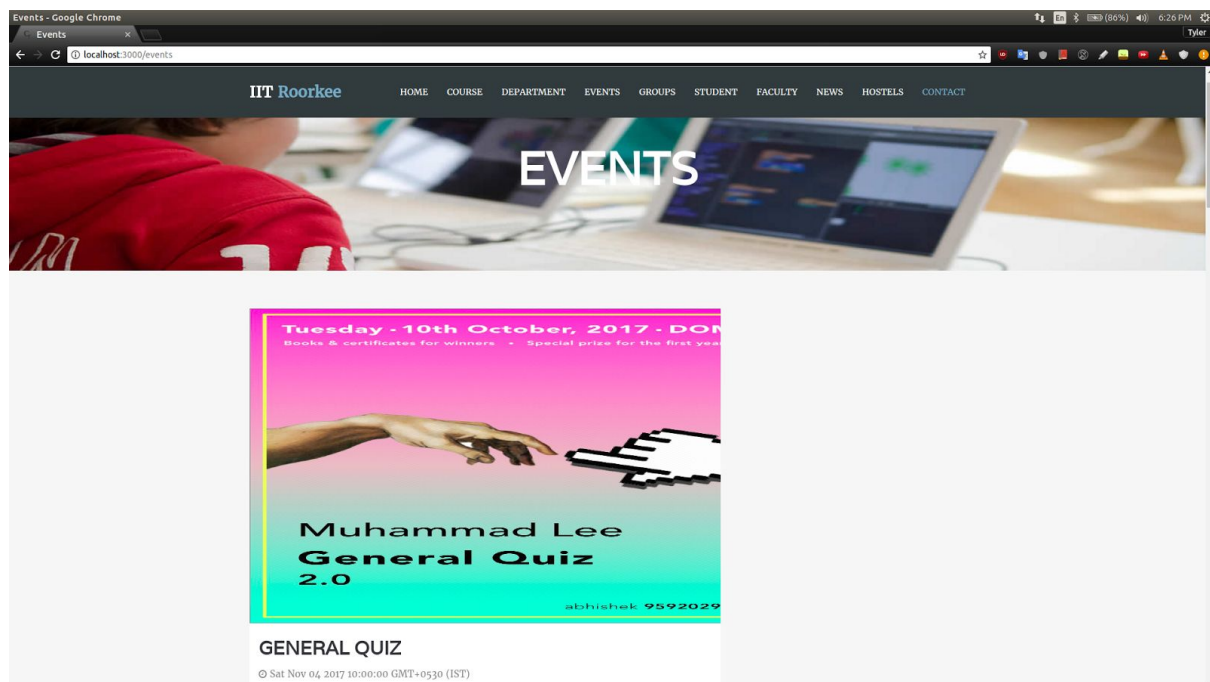
## Related News and Events Department wise

All the news and events specific to the department are seen in this page



## Separate Page for Events

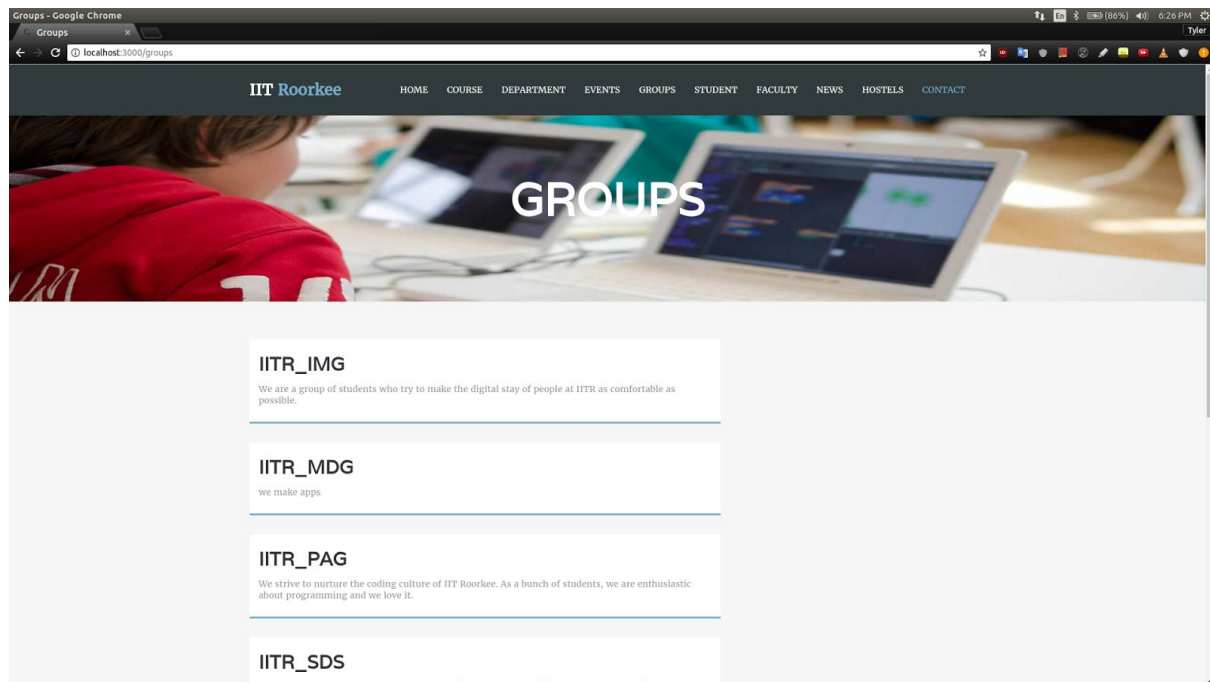
All the events are written in a separate webpage



## Campus Groups

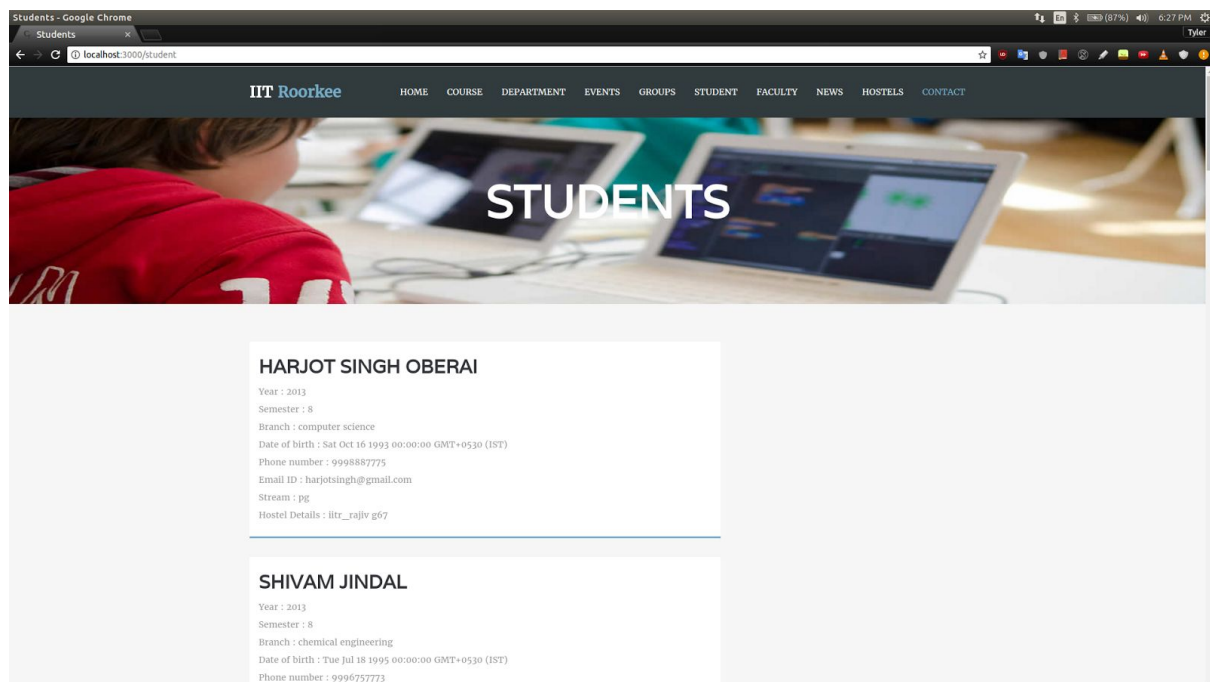
All the internal groups present in the campus

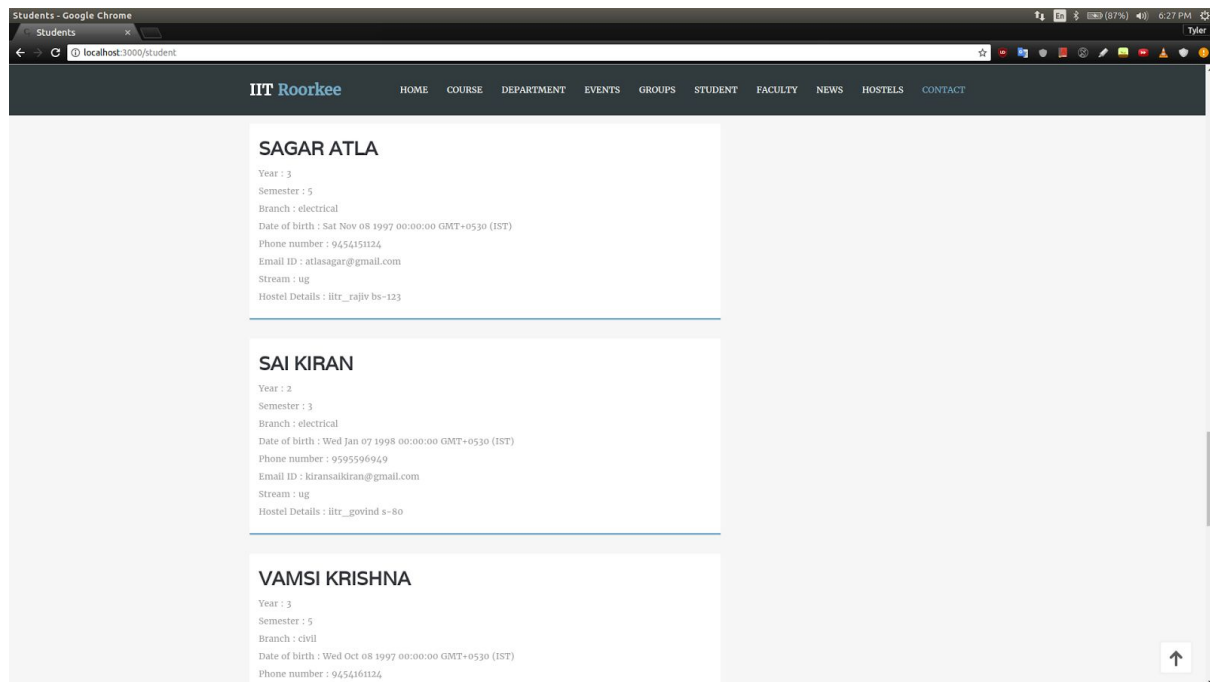




## Students

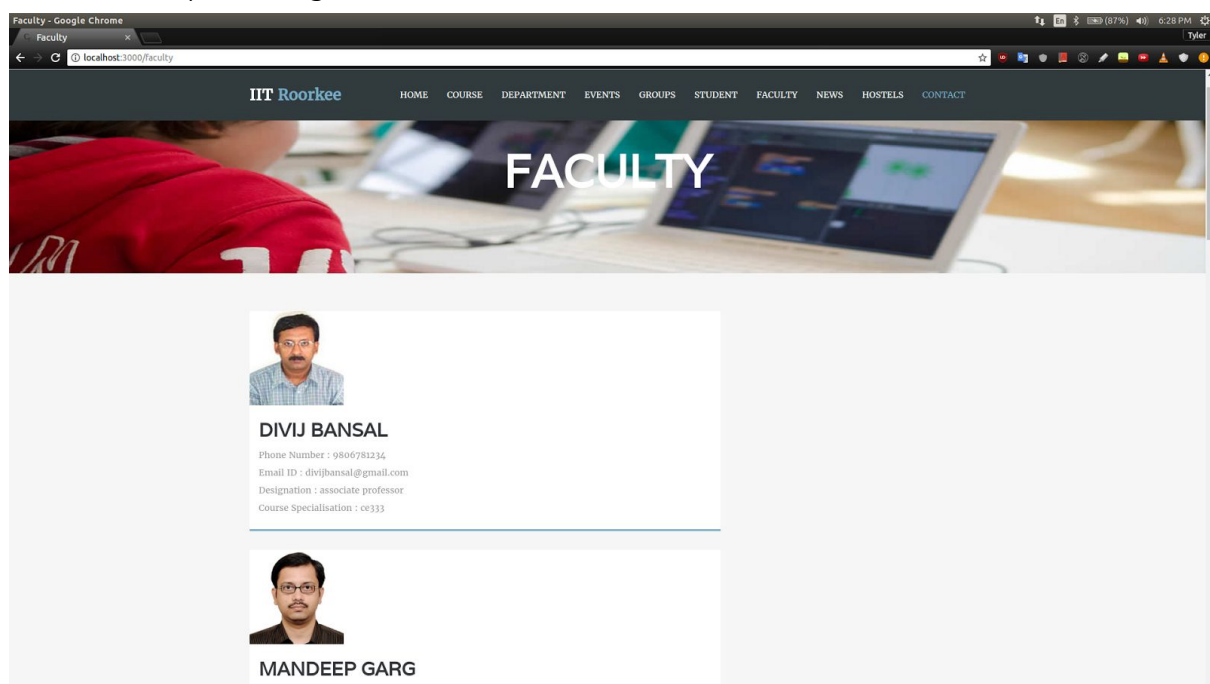
All the student info enrolled in the institute

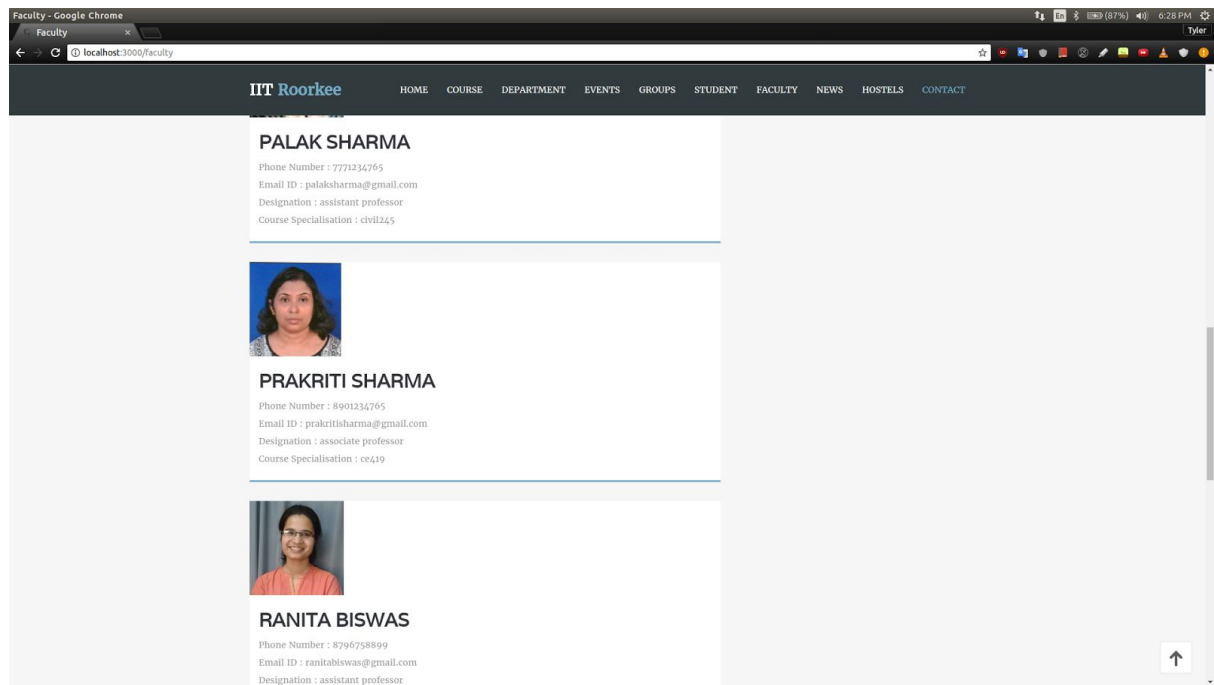




## Faculty

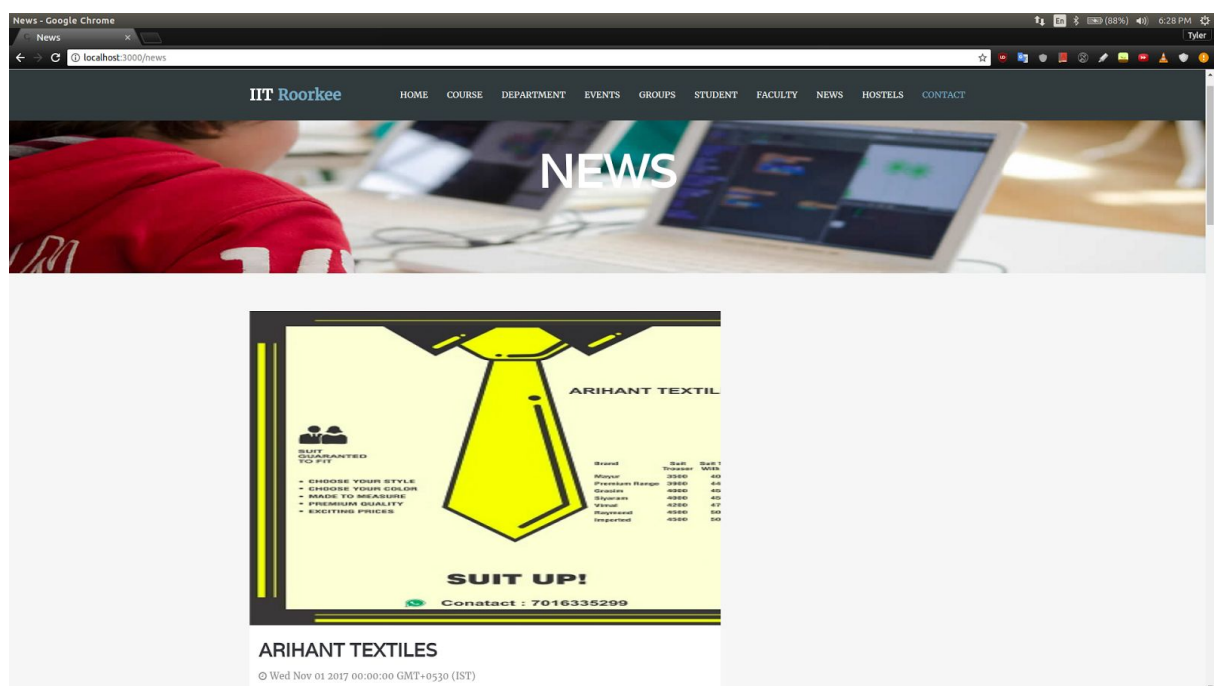
All the faculty working in the institute and the information about the same



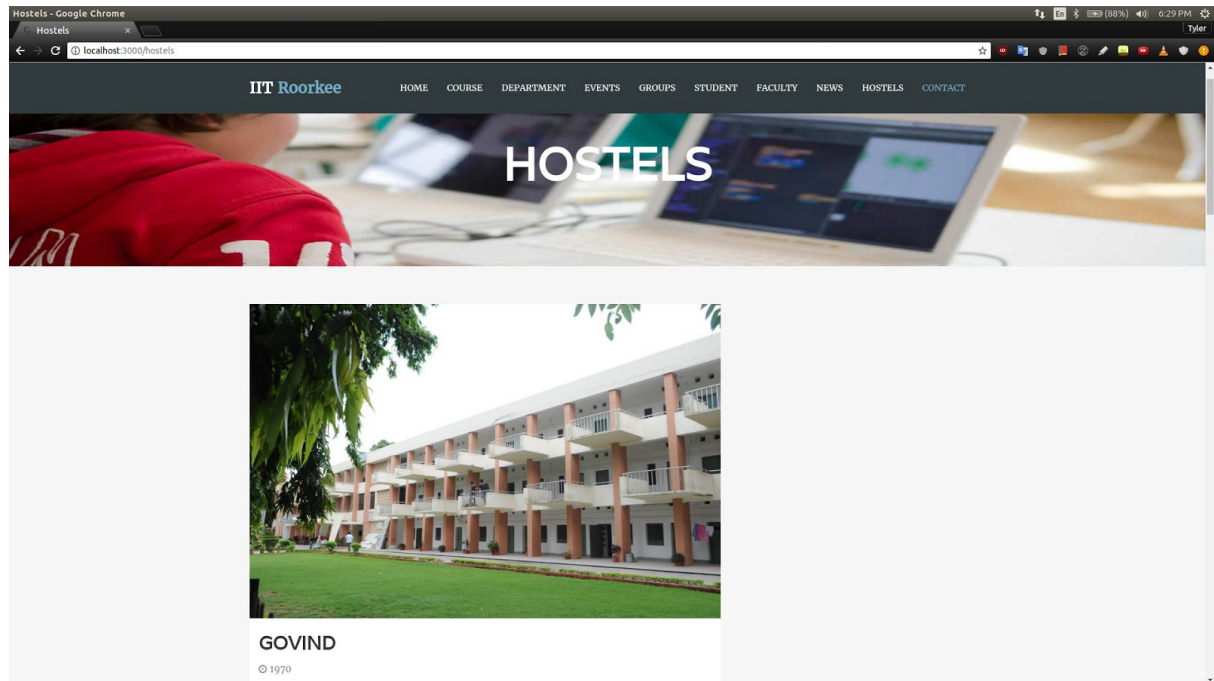


## Separate Page for News

All the news about the campus are written in a separate webpage

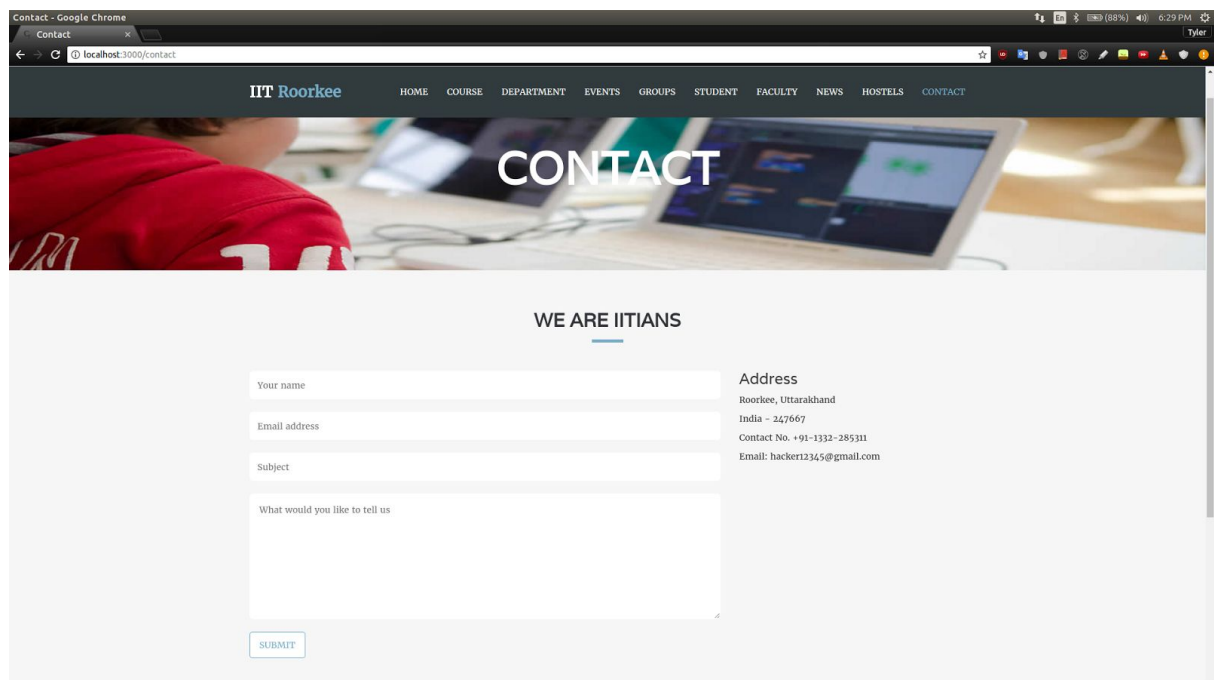


**Hostels** - All the available hostels in the institute



## Contact Page

A separate webpage for contacting the institute authorities



## Instructions:

- Install node.js
- Install npm in
- Install mysql-workbench

→ `sudo service mysql start`

→ `sudo service apache2 start`

→ `sudo mysql-workbench`

Clone the repository from [github](https://github.com).

Cd to the directory

Import the database into the mysql workbench

Run the commands

→ `npm install`

→ `npm start`

Now the server will be running at "localhost:3000"

## The extra features which we wanted to implement are the following -

1. For the the courses, we wanted to show the department , faculty and the students enrolled in that course . The queries for that goes as follows-

\*Our database doesn't have the data regarding the courses in which students are present..first that needs to be included. Let that be "course\_data" which includes c\_id - course id and s\_id - student id .

-->SELECT \* FROM Course,Course\_data WHERE  
Course.ID=Course\_data.c\_id AND Course.ID = course id; - we will get the details of the students in the course from this

-->SELECT \* FROM Course,Department WHERE  
Course.D\_id=Department.ID AND Department.ID = departmentid of the course; - we will get the details of the department of course from this

-->SELECT \* FROM Course,Faculty WHERE Course.faculty\_ID=Faculty.ID  
AND Faculty.ID = faculty id of the course; - we will get the details of the faculty of the course from this

2. For the students, we wanted to show his department details and the courses he has enrolled in . The queries for that goes as follows-

-->SELECT \* FROM Student,Department WHERE  
Student.department\_id=Department.ID AND Department.ID = departmentid of the  
student; - we will get the details of the department of student from this

-->SELECT \* FROM Course,Course\_data WHERE  
Student.ID=Course\_data.s\_id AND Student.ID = student id; - we will get the details  
of the courses of the student from this

3. For the news, we wanted to create separate pages for it

-->'SELECT \* FROM News WHERE ID =?',[str] for the details of the news

4. For the faculty, we wanted to create a page for him and show his details  
along with the courses taught by him.

-->'SELECT \* FROM Faculty WHERE ID =?',[str]

-->'SELECT \* FROM Faculty,Courses WHERE Faculty.ID=Courses.Faculty\_ID  
AND Faculty.ID=?',[str]